


# TRAITÉ DE COOPÉRATION EN MATIÈRE DE BREVETS

## PCT

### RAPPORT PRÉLIMINAIRE INTERNATIONAL SUR LA BREVETABILITÉ

(chapitre II du Traité de coopération en matière de brevets)

(article 36 et règle 70 du PCT)

Référence du dossier du déposant ou du mandataire	<b>POUR SUITE À DONNER</b>		voir le formulaire PCT/PEA416
Demande internationale No. PCT/EP2005/051404	Date du dépôt international (jour/mois/année) 27.03.2005	Date de priorité (jour/mois/année) 13.04.2004	
Classification internationale des brevets (CIB) ou à la fois classification nationale et CIB INV. G21K1/00			
Déposant E-QUANTIC COMMUNICATIONS et al.			
<p>1. Le présent rapport est le rapport d'examen préliminaire international, établi par l'administration chargée de l'examen préliminaire international en vertu de l'article 35 et transmis au déposant conformément à l'article 36.</p> <p>2. Ce RAPPORT comprend 6 feuilles, y compris la présente feuille de couverture.</p> <p>3. Ce rapport est accompagné d'ANNEXES, qui comprennent :</p> <p>a. <input type="checkbox"/> un total de (envoyées au déposant et au Bureau international) feuilles, définies comme suit :</p> <p><input type="checkbox"/> les feuilles de la description, des revendications ou des dessins qui ont été modifiées et qui servent de base au présent rapport ou des feuilles contenant des rectifications autorisées par la présente administration (voir la règle 70.16 et l'instruction administrative 607).</p> <p><input type="checkbox"/> des feuilles qui remplacent des feuilles précédentes, mais dont la présente administration considère qu'elles contiennent une modification qui va au-delà de l'exposé de l'invention qui figure dans la demande internationale telle qu'elle a été déposée, comme il est indiqué au point 4 du cadre n° I et dans le cadre supplémentaire.</p> <p>b. <input type="checkbox"/> (envoyées au Bureau international seulement) un total de (préciser le type et le nombre de support(s) électronique(s)) , qui contiennent un listing de la ou des séquences ou un ou des tableaux y relatifs, déposés sous forme électronique seulement, comme il est indiqué dans le cadre supplémentaire relatif au listing de la ou des séquences (voir l'instruction administrative 802).</p>			
<p>4. Le présent rapport contient des indications et les pages correspondantes relatives aux points suivants :</p> <p><input checked="" type="checkbox"/> Cadre n° I Base du rapport</p> <p><input checked="" type="checkbox"/> Cadre n° II Priorité</p> <p><input type="checkbox"/> Cadre n° III Absence de formulation d'opinion quant à la nouveauté, l'activité inventive et la possibilité d'application industrielle</p> <p><input type="checkbox"/> Cadre n° IV Absence d'unité de l'invention</p> <p><input checked="" type="checkbox"/> Cadre n° V Déclaration motivée selon l'article 35.2) quant à la nouveauté, l'activité inventive et la possibilité d'application industrielle; citations et explications à l'appui de cette déclaration</p> <p><input type="checkbox"/> Cadre n° VI Certains documents cités</p> <p><input type="checkbox"/> Cadre n° VII Certaines irrégularités dans la demande internationale</p> <p><input checked="" type="checkbox"/> Cadre n° VIII Certaines observations relatives à la demande internationale</p>			
Date de présentation de la demande d'examen préliminaire international 02.02.2006		Date d'achèvement du présent rapport 04.08.2006	
Nom et adresse postale de l'administration chargée de l'examen préliminaire international  Office européen des brevets - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tél. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Fonctionnaire autorisé Capostagno, E N° de téléphone +31 70 340-3221	



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	<div style="display: flex; justify-content: space-between;"> <span><b>FOR FURTHER ACTION</b></span> <span>See Form PCT/IPEA/416</span> </div>	
International application No.	International filing date <i>(day/month/year)</i>	Priority date <i>(day/month/year)</i>
International Patent Classification (IPC) or national classification and IPC		
Applicant		

1.	This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of _____ sheets, including this cover sheet.
3.	This report is also accompanied by ANNEXES, comprising: <div style="margin-left: 20px;">           a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of _____ sheets, as follows:           <div style="margin-left: 20px;"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).                  <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.             </div> </div> <div style="margin-left: 20px;">           b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).         </div>
4.	This report contains indications relating to the following items: <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Box No. I      Basis of the report            <input type="checkbox"/> Box No. II      Priority            <input type="checkbox"/> Box No. III      Non-establishment of opinion with regard to novelty, inventive step and industrial applicability            <input type="checkbox"/> Box No. IV      Lack of unity of invention            <input type="checkbox"/> Box No. V      Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement            <input type="checkbox"/> Box No. VI      Certain documents cited            <input type="checkbox"/> Box No. VII      Certain defects in the international application            <input type="checkbox"/> Box No. VIII      Certain observations on the international application         </div>

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

# RAPPORT PRÉLIMINAIRE INTERNATIONAL SUR LA BREVETABILITÉ

Demande internationale n°  
PCT/EP2005/051404

## Case No. I Base du rapport

1. En ce qui concerne la **langue**, le présent rapport est établi sur la base
- ☒ de la demande internationale dans la langue dans laquelle elle a été déposée
- ☐ d'une traduction de la demande internationale dans la langue suivante ,  
qui est la langue d'une traduction remise aux fins de :
- ☐ la recherche internationale (selon les règles 12.3.a) et 23.1.b))
- ☐ la publication de la demande internationale (selon la règle 12.4.a))
- ☐ l'examen préliminaire international (selon la règle 55.2.a) ou 55.3.a))
2. En ce qui concerne les **éléments**\* de la demande internationale, le présent rapport est établi sur la base des éléments suivants (*les feuilles de remplacement qui ont été remises à l'office récepteur en réponse à une invitation faite conformément à l'article 14 sont considérées dans le présent rapport comme "initialement déposées" et ne sont pas jointes en annexe au rapport.*) :

**Description, Pages**

1-7                   telles qu'initialement déposées

## Revendications, No.

telles que modifiées (accompagnées, le cas échéant d'une déclaration) en vertu de l'article 19

## Dessins, Feuilles

**1/4-4/4**                      telles qu'initialement déposées

- ☐ En ce qui concerne un listage de la ou des séquences ou un ou des tableaux y relatifs, voir le cadre supplémentaire relatif au listage de la ou des séquences.
3. ☐ Les modifications ont entraîné l'annulation :
- ☐ de la description, pages
  - ☐ des revendications, nos
  - ☐ des dessins, feuilles/fig.
  - ☐ du listage de la ou des séquences (*préciser*) :
  - ☐ d'un ou de tous les tableaux relatifs au listage de la ou des séquences (*préciser*) :
4. ☐ Le présent rapport a été établi abstraction faite (de certaines) des modifications, qui ont été considérées comme allant au-delà de l'exposé de l'invention tel qu'il a été déposé, comme il est indiqué dans le cadre supplémentaire (règle 70.2.c)).
- ☐ de la description, pages
  - ☐ des revendications, nos
  - ☐ des dessins, feuilles/fig.
  - ☐ du listage de la ou des séquences (*préciser*) :
  - ☐ d'un ou de tous les tableaux relatifs au listage de la ou des séquences (*préciser*) : .

\* Si le cas visé au point 4 s'applique, certaines ou toutes ces feuilles peuvent être revêtues de la mention "remplacé".

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No. \_\_\_\_\_

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☐ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
  - ☐ international search (Rules 12.3(a) and 23.1(b))
  - ☐ publication of the international application (Rule 12.4(a))
  - ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☐ the international application as originally filed/furnished
- ☐ the description:
  - pages \_\_\_\_\_ as originally filed/furnished
  - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
  - pages \_\_\_\_\_ as originally filed/furnished
  - pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
  - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
  - pages \_\_\_\_\_ as originally filed/furnished
  - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
  - pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

**RAPPORT PRÉLIMINAIRE INTERNATIONAL  
SUR LA BREVETABILITÉ**

Demande internationale n°  
PCT/EP2005/051404

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**Case No. II Priorité**

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1. ☐ Le présent rapport a été établi comme si aucune priorité n'avait été revendiquée, du fait que le ou les documents exigés suivants n'ont pas été remis dans le délai prescrit :
- ☒ copie de la demande antérieure dont la priorité a été revendiquée (règle 66.7.a))
  - ☐ traduction de la demande antérieure dont la priorité a été revendiquée (règle 66.7.b))
2. ☐ Le présent rapport a été établi comme si aucune priorité n'avait été revendiquée, du fait que la revendication de priorité a été jugée non valable (règle 64.1). Pour les besoins du présent rapport, la date de dépôt international indiquée plus haut est donc considérée comme la date pertinente.
3. Observations complémentaires, le cas échéant :

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**Cadre n° V Déclaration motivée selon l'article 35.2) quant à la nouveauté, l'activité inventive et la possibilité d'application industrielle; citations et explications à l'appui de cette déclaration**

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1. Déclaration

Nouveauté	Oui:	Revendications	1-16
	Non:	Revendications	
Activité inventive	Oui:	Revendications	1-16
	Non:	Revendications	
Possibilité d'application industrielle	Oui:	Revendications	1-16
	Non:	Revendications	

2. Citations et explications (règle 70.7) :

**voir feuille séparée**

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**Cadre n° VIII Observations relatives à la demande internationale**

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Les observations suivantes sont faites au sujet de la clarté des revendications, de la description et des dessins ou de la question de savoir si les revendications se fondent entièrement sur la description :

**voir feuille séparée**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

International application No.

**Box No. II      Priority**

1. ☐ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
  - ☐ copy of the earlier application whose priority has been claimed (Rule 66.7(a))
  - ☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b))
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

## 1. Statement

Novelty (N)	Claims	_____	YES
	Claims	_____	NO
Inventive step (IS)	Claims	_____	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	_____	YES
	Claims	_____	NO

## 2. Citations and explanations (Rule 70.7)

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

International application No.

**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:



**Concerning the point V**

**Reasoned statement concerning the innovation, the inventive activity and the industrial possibility of application; quotations and explanations in support of this statement**

D1: COLLINS C B ET AL: "Accelerated emission of gamma rays from the 31-yr isomer of  $^{178}\text{Hf}$  induced by X-ray irradiation" PHYSICAL REVIEW LETTERS APS USA, vol. 82, no. 4, January 25, 1999 (1999-01-25), pages 695-698, XP002304655 ISSN: 0031-9007

D3: JULSGAARD B ET AL: "Experimental long-lived entanglement of two macroscopic objects" NATURE NATURE PUBLISHING GROUP U.K., vol. 413, no. 6854, September 27, 2001 (2001-09-27), pages 400-403, XP002342852 ISSN: 0028-0836 (introduced into the procedure by the administration)

1. The purpose of claim 1 is new and inventive for the following reasons:
  - 1.1 The document D3, which is regarded as being the state of the art nearest to the purpose of claim 1 describes (see page 400, left column, last subparagraph; Fig. 1; page 403, left column, subparagraphs 1, 2):  
a sample containing some excited isomer nuclides entangled between each other (that is to say presenting quantum couplings between some of excited nuclei of said nuclides contained in the sample).
  - 1.2 Consequently, the purpose of claim 1 is different from this known sample in that the measurable half-life on at least one excited isomer nuclide of the entangled sample, during its natural deexcitation, is variable, the initial half-life of said nuclide being lower than the theoretical half-life of said nuclide, and the value of the half-life of said nuclide varying from the value of the initial half-life to the value of the theoretical half-life of said nuclide, then increasing beyond this value of the aforesaid theoretical half-life. The purpose of claim 1 is thus new.
  - 1.3 The problem that the present invention proposes to solve can thus be regarded as obtaining a radioactive element with a half-life variable without stimulation and adaptable for a given implementation (see description, page 3, lines 13-17).

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- 1.4 The solution proposed by the present Invention consists in the irradiation of samples containing some isomer nuclides, using entangled gamma rays.
- 1.5 This solution is regarded as implying an inventive activity (article 33 (3) PCT), and this for the following reasons:  
according to an interpretation of quantum mechanics, the irradiation of isomeric nuclides by entangled gamma rays, allows the transfer of the properties of entanglement to the isomer nuclides themselves.  
By extending this property of quantum mechanics to the macroscopic systems, the applicant affirms that the radioactive products obtained by irradiation with entangled gamma rays, would present a variable half-life, and that because of the connections (not specified) which would be established between entangled nuclides (see description, page 3, lines 2 - 4). The radioactive law of attenuation would in addition be determined by the mode of irradiation. This property and irradiation with entangled gamma rays not being suggested by the documents of former art, the purpose of claim 1 satisfied thus with the criterion of inventiveness of the PCT.
- 1.6 The independent claim 8 reveals a manufacturing process of the sample of claim 1 by irradiation with entangled gamma rays.  
Mutatis mutandis, the purpose of claim 8 is thus also new.
- 1.7 The independent claim 10 reveals the use of the sample of claim 1 as a radioactive source with variable half-life.  
Mutatis mutandis, the purpose of claim 10 is thus also new.
2. Claims 2-7, 14-16 depend on claim 1 and thus also satisfy, as such, in requirements of the PCT with regard to the novelty and the inventive activity.
3. Claim 9 depends on claim 8 and thus satisfied also, as such, in requirements of the PCT with regard to the novelty and the inventive activity.
4. Claims 11-13 depend on claim 10 and thus also satisfy, as such, in requirements of the PCT with regard to the novelty and the inventive activity.

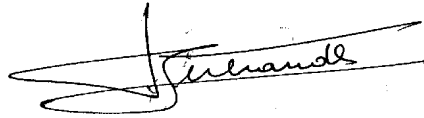
### **Concerning item VIII**

The present application seems to be based on the assumption that certain isomer nuclides, after irradiation with entangled gamma rays, can deexcite according to a curve of variable probability in time, thus generating a radiation of variable intensity in time (see description, page 3, lines 2-12).

The description, however, obviously does not provide a proof of the existence of such an effect. In the current state of knowledge, isomer nuclides irradiated under specific conditions (such as for example those described in D1), are subject to an instantaneous accelerated deexcitation ("prompt"), non durable in a significant way in time.

Because of the absence in the description and in claim 1, of a clear definition of the means to induce or stimulate this possible property in isomer nuclides, the administration expresses its doubts as for the possibility that this very property can be regarded as an invention.

I certify that this document is the English translation,  
to the best of my knowledge, of the document  
referenced in the first page.

A handwritten signature in black ink, appearing to read "Desbrandes", with a large, stylized flourish on the left side.

Robert DESBRANDES, inventor